Results of Beach, Purse, and Pole Seine Surveys at the Courtenay River Estuary and Baynes Sound, Courtenay, B.C., 2000

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by

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ABSTRACT

Jenkins, J.A., B.A. Bravender, C. Beggs, B. Munro, and D. Miller. 2001. Results of beach, purse and pole seine surveys at the Courtenay River estuary and Baynes Sound, Courtenay, B. C., 2000. Can. Data Rep. Fish. Aquat. Sci. 1077: 39 p.

This report gives data on the distribution and abundance of juvenile salmonids within the Courtenay River estuary and Baynes Sound, from a survey conducted between July and September, 2000.

In a total of 16 sampling trips, 350 juvenile salmonids were caught in 147 beach seine sets, 27 purse seine sets, and 7 pole seine sets. From these 350 fish, 156 juvenile salmonids were measured for length and weight, and condition factors were also calculated. Twelve thousand one hundred and ninety-nine non-salmonid fish were caught in addition to the juvenile salmonids.

Tnere was a broad range of habitat types, including human modified areas, steep river banks and sandy mudflats. Vegetation at the sites included marsh grass, trees, shrubs, eelgrass and algae. Swift currents were measured at a few sites. Salinity, temperature, dissolved oxygen, and depth data were recorded at most sites.

RÉSUMÉ

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Le présent rapport fournit des données sur la distribution et l'abondance des salmonidés juvéniles dans l'estuaire de la Courtenay et la baie Baynes, données recueillies pendant une campagne menée entre juillet et septembre 2000.

Au cours des 16 opérations d'échantillonnage, 350 salmonidés juvéniles ont été capturés dans 147 coups de senne de plage, 27 coups de senne à poche et 7 coups de senne à perche. Parmi ces 350 salmonidés juvéniles, 156 spécimens ont été mesurés (longueur et poids), et on a calculé les coefficients de condition. Outre les salmonidés juvéniles, on a capturé 12 190 poissons autres que des salmonidés.

Les types d'habitat étaient très divers : zones modifiées par l'activité humaine, berges abruptes et battures. La végétation observée se composait de calamagrostis, d'arbres, d'arbustes, de zostère et d'algues. Les courants étaient rapides à certains endroits. La salinité, la température, l'oxygène dissous et la profondeur ont été mesurées à la plupart des stations.

INTRODUCTION

From July 11 to September 6, 2000, sixteen sampling trips were made to determine the distribution and abundance of juvenile salmonids in the Courtenay River estuary and Baynes Sound, located on the east coast of Vancouver Island. Sampling during these trips consisted of beach seines, purse seines and pole seines, and assessed forty-seven sites within and outside the estuary. This study is a follow-up to the field program implemented during the summer of 1998 (MacDougall et al. 1999).

The Puntledge and Tsolum rivers merge to form the Courtenay River approximately two and a half kilometers upstream of the river mouth. As the river empties into Comox Harbour, a two-layered estuarine system with a brackish water upper layer and marine water at deeper depths is formed. There is a net seaward flow of freshwater, due to the low salinity in Comox Harbour compared to the adjacent sea, into Baynes Sound (Morris et al. 1979). Located on the east side of Vancouver Island, Baynes Sound is a narrow trough that is sheltered from wind and wave action by the Comox Bar to the north and Denman and Hornby Islands to the southeast. Waldie (1951) mentions that Baynes Sound is also protected from strong currents because of the presence of a rich organic sand and mud substrate.

Anthropological changes in this area in the past have adversely impacted much of the foreshore. The Courtenay River estuary has been subjected to dredging for marina and wharf construction, log handling, sorting and dumping, and sewage disposal. These activities have had a significant impact on the vegetation, substrate, and the shape of the basin. Water quality of the estuary and Baynes Sound is affected mainly by logging, mining effluents and sewage disposal. Coal mining in Baynes Sound was active during the early 1900's, and the last mine was closed in 1966 (Prentice 1988). The pH of the water may be affected by the sulphuric acid and sodium sulphate leeching from these mines. Both Comox Harbour and Henry Bay on Denman Island have been closed to shellfish harvesting due to high faecal contamination associated with sewage pollution (Morris et al. 1979).

To celebrate the new millennium, the Town of Courtenay and the Canadian Millennium Partnership Program initiated the Millennium Community Park and Habitat Restoration Project in 1998. The completion of this park in March, 2000 provided new salmonid rearing habitat, and three sites were sampled in this area during this survey.

In September 1997, Fisheries and Oceans Canada initiated the development of the Courtenay River Estuary Management Plan. The goals of this plan are to designate types of appropriate activities within the estuary, establish a co-ordinated project review board to address specific proposals within the management plan area, and to promote transparency and public participation in the development and implementation of the plan. This study, in addition to the field program implemented

in 1998, will augment the ecological information for this system by providing baseline data useful to the development of this plan.

MATERIALS AND METHODS

A total of forty-seven sites within the Courtenay River estuary and Baynes Sound were sampled on sixteen trips between July 11 and September 6, 2000. Descriptions and GPS co-ordinates of the sites may be found in Tables 1, 2, and 3. Locations of the sites are shown in Figures 1 and 2. Based on the results of the 1998 survey twelve new sites were added within the Courtenay River estuary, and eight sites were removed. Sampling was also carried out at twenty-one sites in Baynes Sound.

Beach seining in the Courtenay River estuary was done from July 11 to August 15 (Table 4). In Baynes Sound, beach seining began on July 13 and was finished on August 3. Each site was sampled with a beach seine 13.5 m long and 2.9 m deep with 4.5 m wings of 1 cm stretched mesh and a 4.6 m bunt of 0.6 cm stretched mesh. Rope bridles 15 m in length were fitted to each end of the net. The net was pulled offshore to the full length of the rope bridles, where possible, set in a circle back to shore, and retrieved by hand. Duplicate sets were done at each site. Beach seining in the estuary was done using an 18.5 foot aluminium craft, with a 150 hp jet drive. In Baynes Sound a 20 foot Marinex aluminium boat with a 100 hp outboard motor was used.

By late July, the chinook in Baynes Sound had moved offshore and could no longer be captured with the beach seine. On August 11 sampling began in this area with a purse seine 61.5 metres long and 6.2 metres deep, consisting of a 24.6 metre section of 1.8 cm stretched mesh, a 24.6 metre section of 1.25 cm stretched mesh and a 12.3 metre bunt section of 0.6 cm stretched mesh. The net was 6.2 metres deep with a lead line of 2 pounds/fathom. A sea anchor was attached to the bunt section and a purse line of 1.25 cm nylon rope along the lead line allowed the entire length of the net to be pursed. The net was set from a 5.5 metre long aluminium craft powered by a V8 engine equipped with a Hamilton jet drive, fitted with a table at the stern to carry the net. Sets were made by anchoring one end of the net with the buoy and sea anchor and forming a circle with the remainder of the net. The net was then pursed and retrieved until the catch was confined in a small enclosure at the side of the boat. Single sets were done at each site. Only one purse seine was done in the estuary, off of Goose Spit at site 46 (Table 5).

Pole seining was carried out on July 27. Single sets were completed at sites 41, 42, and 44 and duplicate sets were done at sites 43 and 45 (Table 6). The pole seine measured 5.2 metres long and 2.1 metres deep, with 3/8" mesh and poles 4.3 metres long. Where possible, the net was opened to span the full width and pulled the length of the site. At sites 42 and 45, the net was pulled along a portion of the shore.

At most sites the entire catch of non-salmonids was counted and identified to species where possible. Where necessary, the catch was randomly subsampled using a dipnet so as to try and sample all species present in the catch. These fish were then identified and counted and the results multiplied by the subsample proportion to estimate the total catch.

The catch of salmonids was counted and identified to species. Coho and chinook were further identified as marked (CWT) with a clipped adipose fin, unmarked or wild. All or a subsample of salmonids were then anaesthetised with Alka Seltzer™ on shore at the site. The fork length of each fish to the nearest millimetre was recorded, and they were damp dried and weighed to the nearest 0.1g in water using an Ohaus Model No. C305 portable balance. The fish were then placed in a bucket of water from the sampling site to recover, and were released once they were actively swimming inside the bucket.

All sampling was terminated on September 6 as the catches of salmon had dropped off to zero in most areas.

A condition factor (K) for all salmonids was determined using the equation:

$$K = \frac{W}{L^3} \times 10^5$$

where K is the condition factor, W is the wet weight of the fish in grams, and L is the fork length of the salmon in millimetres (Meehan et al. 1978).

Tide heights for Tables 9, 10 and 11 were determined using the Canadian Tide and Current Tables (Canadian Hydrographic Service, Fisheries and Oceans Canada 2000).

A YSI 85 oxygen, conductivity, salinity and temperature meter was used in the Courtenay River estuary and Baynes Sound. Salinity and temperature were recorded at the surface, and then at 1 metre intervals to the bottom, or to 5 metres depth at each site, and dissolved oxygen levels were measured in mg/L ± 2%. Depth ranges were recorded in Baynes Sound using a Humminbird 100SX portable sounder. Two GPS units were used during the survey, an Eagle Explorer and a Motorola TRAXAR GPS Navigator.

RESULTS

Table 7 contains the abbreviated, scientific, and common names of captured fish species. Temperature, salinity, and dissolved oxygen levels may be found in Table 8. A total of 147 beach seines, 27 purse seines and 7 pole seines were completed (Tables 4, 5 and 6). In all catches combined there were 147 coho, 98 chinook, 39 steelhead, 22 rainbow, 43 cutthroat, and 1 chum for a total catch of 350

juvenile salmonids (Tables 9, 10 and 11). A total of 12199 non-salmonid fish were also caught in the seine sets. This included 5270 perch, 3329 sculpins, and 567 sticklebacks.

Lengths and weights were recorded and condition (K) factors were calculated for a total of 156 juvenile salmonids, including 93 chinook. Eighty-three of these fish were unmarked, 8 were wild, and 2 were marked (Table 12). Lengths, weights, and K-factors were also recorded for 62 coho (49 unmarked, 10 fry, 2 wild, and 1 marked). One chum salmon was also measured and weighed. The minimum K-factor (0.74) was calculated for a chinook salmon captured on July 20 at site 30. The maximum recorded K-factor was 1.70, calculated for a chinook salmon caught at site 11 on August 1.

The habitat types within the Courtenay River estuary were varied, from fine mud to sand substrate with little slope (e.g. sites 1 and 17), to very steep sloped gravel beaches covered in marsh grass (e.g. sites 12 and 14). Within Baynes Sound the sites ranged from shallow sloped banks with gravel and sand substrate (e.g. sites 28 and 27) to moderately sloped banks with boulders present midshore (e.g. site 34). Coal was located at sites 30 and 31, with site 31 containing the greatest proportion.

Sampling sites 8, 14, 21, 23, 39, 41 and 42 were located in areas which had been impacted by development, including the construction of large rip rap breakwaters, cement walls and pilings, dredged basins, and areas where foreshore vegetation had been removed or paved over. Vegetation at sites along the Courtenay River included marsh grass, shrubs, and trees. Sites within the estuary typically contained algal species, including *Fucus* sp. and *Ulva* sp., often with marsh grass and shrubs in the high intertidal or backshore.

Sites 21, 41, and 42 were constructed during the Millennium Community Park and Habitat Restoration Project in 1998. The goal was to produce new salmonid rearing habitat. During several sampling trips coho fry, juvenile coho, and juvenile chinook were found at sites 21 and 41. No salmonids were found at site 42, although it was sampled only once with a pole seine on July 27, 2000.

Some areas of the estuary were characterised by high currents including sites 1 and 12, both located along the river channel. Sites 6, located on the north side of Goose Spit, and 24, located in Baynes Sound, were also areas of very swift currents.

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Table 1. GPS locations and descriptions of beach seine sites sampled.

Site No.	Description	GPS
1	Site located in the upper estuary at the mouth of dredged small boat slough. Moderate to steep slope, fine mud substrate. Riverbanks covered in marsh grasses and small shrubs near the water's edge, large trees less than 1 m back from the water. Swift currents. Salinity at 0.0 ‰.	49 40 55.87 124 58 31.12
1A	Site located in a man-made groove off the main river channel. Steep slope. Riprap at entrance, mud/gravel inside with large organic debris present. Marsh and shrubs at higher elevations. Connects at head through a culvert to pond in Millennium Park. Salinity ranges between 0.0 ‰ and 1.6 ‰ at the surface.	49 41 30.48 124 59 39.78
4	Site located where riprap breakwater intersects shoreline, west side of estuary. Rocky/gravel substrate, very gradual slope. *Fucus* sp., and large eelgrass bed offshore. Salinity ranges between 22.7‰ at the surface to 24.3 ‰ at 1 m depth.	N/A
6	Site sampled on the north side of Goose Spit. Sandy substrate, steep slope, some marsh grass on upper shore. Swift currents. Salinity ranges between 13.4 ‰ at the surface to 26.8 ‰ at 4 m depth.	49 39 45.80 124 55 24.70
8	Site sampled within the Comox Marina, at Grid #2. Large rocks, pebble and sand mix on shore, steep slope into the water. Little intertidal vegetation. Sheltered from wind and wave action. Salinity ranges between 20.6 ‰ at the surface to 27.0 ‰ at 1m depth.	49 40 13.21 124 55 37.10
11	Site located at the mouth of Duck Slough in upper estuary. Gravel substrate, moderate slope, and marsh grass on upper shore. Salinity ranges between 0.2 ‰ at the surface to 2.7 ‰ at 1 m depth.	N/A
12	Site sampled adjacent to airpark, on west side of river channel. Steep gravel beach, marsh grass in backshore. Swift current. Salinity ranges between 0.1 ‰ at the surface to 1.1 ‰ at 1m depth.	N/A
14	Site sampled within abandoned dredged boat basin on west side of river channel, north of boat launch. Very steep slope, tall marsh grass, trees to waterline. *Fucus* sp., *Ulva* sp. Salinity ranges between 0.4 ‰ at the surface to 7.3 ‰ at 1 m depth.	49 40 59.12 124 55 06.00
15	Site sampled on south side of Goose Spit. Gentle sloping mid-sized gravel, substrate became sandy at low intertidal/subtidal area, tall grasses and evergreens in backshore, about 5 m from shore. Exposed to wind and wave action. Salinity ranges between 20.9 ‰ at the surface to 27.6 ‰ at 4 m depth.	49 39 33.73 124 55 06.64
17	Site sampled on riverbank, across from Lewis Park. Moderately sloping river banks, sandy substrate covered with marsh grass. Swift current. Salinity at 0.0 ‰.	49 41 38.95 124 59 46.30

Table 1 (cont'd).

Site No.	Description	GPS
18	Site located on east shore of main river channel. Shallow slope. Gravel/mud substrate. Marsh at higher elevation. Salinity at surface 0.2 ‰.	N/A
19	Site located on west side of island, shallow slope. Gravel/mud/sand substrate to marsh on upper shore. Salinity at surface 5.6 ‰.	N/A
20	Site located at head of slough in front of floodgate to Duck Slough. Steep slope, mud substrate. Salinity ranges between 0.3 ‰ at the surface to 9.0 ‰ at 2 m depth.	49 41 02.08 124 58 37.88
21	Site located in man-made bay in Millennium Park at the head of the boat slough. Steep slope, mud/gravel substrate, sparse marsh on upper shore. Heavy overgrowth of vegetation in water. Salinity ranges between 0.1 ‰ at the surface to 0.4 ‰ at 1 m depth.	49 41 34.18 124 59 33.93
22	Site located in airpark marina at confluence with main river channel. Steep slope. Gravel/mud substrate, sparse vegetation, and pilings on upper shore. Salinity ranges between 0.7‰ at the surface to 17.8 ‰ at 1 m depth.	N/A
23	Site located in abandoned man-made sewage treatment lagoon. Shallow to steep slope. Fine mud substrate. Thick marsh vegetation. Salinity ranges between 11.3 ‰ at the surface to 10.8 ‰ at 1 m depth.	N/A
24	Site located at the confluence of the Puntledge and Tsolum rivers. Shallow slope. Gravel/cobble/sand substrate. Riparian on upper shore. Very swift currents. Salinity at 0.0 ‰.	49 41 57.01 124 59 48.81
25	Site located on the western shore of Sandy Island. Moderate slope. Gravel/sand substrate. Eelgrass bed offshore. Sparse marsh vegetation, debris on upper shore. Salinity ranges between 24.6 ‰ at the surface to 27.1 ‰ at 3 m depth.	49 37 00.87 124 51 12.19
26	Site in Henry Bay on Denman Island. Sand/gravel. Moderate slope with large trees on upper shore. Eelgrass bed offshore. Salinity ranges between 24.7 ‰ at the surface to 27.1 ‰ at 4 m depth.	49 36 21.30 124 50 15.50
27	Site located north of Denman Point on Denman Island. Sand offshore with eelgrass bed. Gravel beach, riparian upshore, rocky with *Fucus* sp., slight slope. Salinity ranges between 24.7 ‰ at the surface to 25.9‰ at 2 m depth.	49 35 44.81 124 50 18.65
28	Site located at Denman Point on Denman Island. Shallow slope. Gravel/cobble/sand substrate. Riparian on upper shore. Salinity ranges between 24.8 ‰ at the surface to 26.9 ‰ at 4m depth.	49 33. 706 124 51. 321
29	Site located at Oyster Shop. Sand/eelgrass offshore, moderate slope. Gravel boulders higher, narrow riparian strip on upper shore. Shallow slope gravel. Gravel foreshore, fairly steep to riparian zone. Salinity ranges between 24.2‰ at the surface to 26.7 ‰ at 2 m depth.	49 33 54.64 124 52 25.71

Table 1 (cont'd).

Site No.	Description	GPS
30	Site at the mouth of Union Bay. Moderate slope. Gravel/sand/mud substrate. Coal on upper shore. Salinity ranges between 22.6 ‰ at the surface to 27.7 ‰ at 5 m depth.	49 35 07.02 124 53 01.08
31	Site located at mouth of Hart Creek. Shallow slope. Coal dominated substrate with mud/gravel on lower shore. Salinity ranges between 23.9 ‰ to 24.5 ‰ at the surface.	N/A
32	Site located at Willemar Bluff. Salinity ranges between 18.3 ‰ at the surface to 26.8 ‰ at 4 m depth.	49 40 16.60 124 53 35.28
33	Site sampled at Point Holmes. Gravel upper shore and midshore, with sand flat offshore. Moderately sloped with some algae present. Salinity ranges between 24.7 ‰ at the surface to 27.6 ‰ at 5 m depth.	49 41 32.90 124 52 00.84
34	Site sampled at Kingfisher Inn. Moderate slope, boulders midshore, sand/boulder low shore, eelgrass and kelp offshore. *Fucus* sp. Present on the upper slope. Salinity ranges between 21.9 ‰ at the surface to 26.7 ‰ at 5 m depth.	49 37 15.67 124 54 18.02
39	Site located in man-made anchorage off main river channel. Shallow slope, mud/gravel substrate. Cement walls and pilings on upper shore. Salinity ranges between 0.6 ‰ to 20.0 ‰ at the surface.	N/A
40	Site located at mouth of Millard Creek. Shallow slope, mud substrate. Thick marsh and riparian on upper shore. Salinity ranges between 21.5 ‰ at the surface and 21.9 ‰ at 1 m depth.	N/A

Table 2. GPS locations and descriptions of purse seine sites sampled.

Site No.	Description	GPS
35	Offshore site located near Cape Lazo. Depth ranges between 17 and 18 m.	N/A
36	Offshore site located near Palliser Rock. Salinity ranges between 26.7 ‰ at the surface to 27.9 ‰ at 5 m depth. Depth ranges between 12 and 16 m.	49 37 48.01 124 50 02.51
37	Offshore site northeast of Sandy Island. Salinity ranges between 26.2 ‰ at the surface to 27.7 ‰ at 3 m depth. Depth ranges between 12 and 19 m.	N/A
46	Offshore site sampled on the north side of Goose Spit. Swift currents. Salinity ranges between 13.4 ‰ at the surface to 26.8 ‰ at 4 m depth. Depth ranges between 22 and 27 m.	49 39 45.694 124 55.656
47	Offshore site sampled on south side of Goose Spit. Exposed to wind and wave action. Salinity ranges between 20.9 ‰ at the surface to 27.6 ‰ at 4 m depth. Depth ranges between 7 and 18 m.	49 39. 477 124 54. 021
48	Offshore site located off the western shore of Sandy Island. Eelgrass bed. Salinity ranges between 24.6 ‰ at the surface to 27.1 ‰ at 3 m depth. Depth at approximately 12 m.	49 37 00.87 124 51 12.19
49	Offshore site in Henry Bay on Denman Island. Eelgrass bed. Salinity ranges between 24.7 ‰ at the surface to 27.1 ‰ at 4 m depth. Depth ranges between 33 and 35 m.	49 36.176 124 50. 998
50	Offshore site located at Denman Point on Denman Island. Salinity ranges between 24.8 ‰ at the surface to 26.9 ‰ at 4 m depth.	49 33. 706 124 51. 321
51	Offshore site located at Oyster Shop. Sand/eelgrass. Salinity ranges between 24.2 ‰ at the surface to 26.7 ‰ at 2 m depth.	49 33. 691 124 52. 574
52	Offshore site at the mouth of Union Bay. Salinity ranges between 22.6 ‰ at the surface to 27.7 ‰ at 5 m depth. Depth ranges between 22 and 25 m.	49 34 59.50 124 52 53.75
53	Offshore site located at Willemar Bluff. Salinity ranges between 18.3 ‰ at the surface to 26.8 ‰ at 4 m depth. Depth ranges between 12 and 23 m.	49 40. 315 124 52. 059
54	Offshore site sampled at Point Holmes. Salinity ranges between 24.7 ‰ at the surface to 27.6 ‰ at 5 m depth. Depth ranges between 9 and 29 m.	49 41.121 124 51.149
55	Offshore site sampled at Kingfisher Inn. Eelgrass and kelp. Salinity ranges between 21.9 ‰ at the surface to 26.7 ‰ at 5 m depth. Depth ranges between 19 and 21 m.	49 37. 058 124 54. 475

Table 3. GPS locations and descriptions of pole seine sites sampled.

Site No.	Description	GPS
41	Site located in a man-made groove off the main river channel. Steep slope. Riprap at entrance, mud/gravel inside with large organic debris present. Marsh and shrubs at higher elevations. Connects at head through a culvert to pond in Millenium Park. Salinity ranges between 0.0 ‰ and 1.6 ‰ at the surface.	49 41 30.48 124 59 39.78
42	Site located in man-made pond in Millenium Park. Steep slope. Marsh and shrubs at higher elevations. Culvert at southern end to boat slough. Salinity at 0.0 ‰.	49 41 29.54 124 59 34.86
43	Site located at the mouth of Duck Slough in upper estuary. Gravel substrate, moderate slope, marsh grass on upper shore. Salinity ranges between 0.2 ‰ at the surface to 2.7 ‰ at 1 m depth.	N/A
44	Site in small, shallow pothole in upper marsh near site 11. Sampled at low tide. Mud/debris. Steep slope. Heavy marsh vegetation. Salinity at 7.5 ‰ at the surface.	49 40 55.95 124 58 33.26
45	Site located at head of slough in front of flood gate to Duck Slough. Steep slope, mud substrate. Salinity ranges between 0.3 ‰ at the surface to 9.0 ‰ at 2 m depth.	49 41 02.08 124 58 37.88

Table 4. Sampling schedule for the 2000 Courtenay River estuary and Baynes Sound beach seine survey.

Date	Jul-11	Jul-13	Jul-17	Jul-20	Jul-25	Aug-01	Aug-03	Aug-09	Aug-15	Total Sets
Trip No.	1	2	3	4	5	7	8	9	11	
	Sets									
Stn. No.										
1	2	0	0	0	0	0	0	2	2	6
1A	0	0	2	0	0	0	0	0	0	2
4	0	0	0	0	0	2	0	0	0	2
6	2	0	2	0	2	2	0	2	0	10
8	2	0	2	0	2	2	0	2	0	10
11	2	0	0	0	2	2	0	2	0	8
12	0	0	0	0	0	2	0	2	2	6
14	0	0	2	0	2	0	0	0	0	4
15	0	2	0	2	0	0	2	0	0	6
17	2	0	0	0	2	0	0	0	2	6
18	2	0	0	0	0	0	0	0	0	2
19	2	0	0	0	0	0	0	0	0	2
20	2	0	2	0	0	0	0	2	0	6
21	2	0	0	0	2	2	0	2	0	8
22	0	0	2	0	0	2	0	0	2	6
23	0	0	3	0	0	0	0	0	0	3
24	0	0	2	0	2	0	0	2	0	6
25	0	0	0	2	0	0	2	0	0	4
26	0	2	0	2	0	0	2	0	0	6
27	0	2	0	2	0	0	2	0	0	6
28	0	2	0	0	0	0	0	0	0	2
29	0	2	0	2	0	0	2	0	0	6
30	0	2	0	2	0	0	0	0	0	4
31	0	2	0	0	0	0	2	0	0	4
32	0	2	0	2	0	0	2	0	0	6
33	0	0	0	2	0	0	2	0	0	4
34	0	0	0	0	0	0	2	0	0	2
39	0	0	2	0	2	0	0	2	2	8
40	0	0	0	0	0	2	0	0	0	2
Total Sets	18	16	19	16	16	16	18	18	10	147

Table 5. Sampling schedule for the 2000 Courtenay River estuary and Baynes Sound purse seine survey.

Date	Aug-11	Aug-17	Aug-22	Aug-24	Aug-29	Sep-06	Total Sets
Trip No.	10	12	13	14	15	16	
	Sets						
Stn. No.							
35	0	0	1	0	0	0	1
36	0	0	1	0	0	1	2
37	0	1	1	0	0	0	2
46	0	0	0	0	1	0	1
47	1	0	1	0	1	0	3
48	0	1	0	1	0	0	2
49	0	1	0	1	0	1	3
50	0	0	0	1	0	0	1
51	0	1	0	1	0	0	2
52	0	0	0	0	0	1	1
53	1	0	0	0	1	0	2
54	1	0	1	0	1	1	4
55	0	1	0	1	1	0	3
Total Sets	3	5	5	5	5	4	27

Table 6. Sites sampled during the July 27 Courtenay River estuary pole seine survey.

Stn. No.	41	42	43	44	45	Total Sets
Sets	1	1	2	1	2	7

Table 7. Species of fish captured and abbreviations.

Fish Species	Common name	Abbreviation
Ammodytes hexapterus	Pacific sandlance	PASA
Apodichthys flavidus	Penpoint gunnel	PEGU
Brachyistius frenatus	Kelp surfperch	KELP
Cymatogaster aggregata	Shiner surfperch	SHIN
Damalichthys vacca	Pile surfperch	PILE
Embiotoca jacksoni	Black surfperch	BLAC
Family Bathymasteridae	Unidentified ronquil	RONQ
Family Bothidae	Unidentified sanddab	SAND
Family Cottidae	Unidentified sculpin	UNSC
Family Embiotocidae	Unidentified perch	UNPE
Family Hexagrammidae	Unidentified greenling	UNGR
Family Pholididae	Unidentified gunnel	UNGU
Family Scorpaenidae	Unidentified rockfish	UNRO
Family Blenniidae	Unidentified blenny	UNBL
Gasterosteus aculeatus	Threespine stickleback	THST
Lumpenus sagitta	Pacific snake prickleback	SNPR
Oncorhynchus keta	Juvenile chum	CHUM
Oncorhynchus kisutch	Juvenile unmarked coho	COHO
Oncorhynchus kisutch	Juvenile marked coho	MKCO
Oncorhynchus kisutch	Juvenile wild coho	WLCO
Oncorhynchus kisutch	Coho salmon fry	COFR
Oncorhynchus mykiss	Juvenile rainbow trout	RAIN
Oncorhynchus tshawytscha	Juvenile unmarked chinook	CHIN
Oncorhynchus tshawytscha	Juvenile marked chinook	MKCH
Oncorhynchus tshawytscha	Juvenile wild chinook	WLCK
Hippoglossus stenolepis	Pacific halibut	HALI
Order Pleuronectiformes	Unidentified flatfish	FLAT
Pholis laeta	Crescent gunnel	CRGU
Pholis ornata	Saddleback gunnel	SAGU
Platichthys stellatus	Starry flounder	STFL
Salmo clarki clarki	Cutthroat trout	CUTT
Salmo gairdneri	Juvenile steelhead	STHE
Syngnathus leptorhynchus	Bay pipefish	BAPI

Table 8. Temperature, salinity and dissolved oxygen data (n/s=not sampled).

Date/Site	Time (PST)	Depth (m)	Temp (°C)	Salinity (‰)	Oxygen (mg/L)
July 11/00					
Site 17	0900	surface	16.8	0.0	n/s
Site 1	0920	surface	16.9	0.0	n/s
"		1	16.8	0.0	n/s
Site 18	1005	surface	17.2	0.2	n/s
Site 8	1045	surface	19.2	24.5	n/s
"		1	18.9	24.7	n/s
Site 6	1200	surface	19.1	24.9	n/s
"		1	18.8	24.8	n/s
Site 19	1237	surface	21.8	5.6	n/s
Site 20	1310	surface	18.8	0.3	n/s
"		1	18.7	0.3	n/s
"		2	20.4	9.0	n/s
Site 11	1400	surface	18.7	0.2	9.30
"		1	18.7	0.2	9.30
Site 21	1440	surface	19.2	0.1	n/s
"		1	18.6	0.1	n/s
"		2	18.1	0.1	n/s
July 13/00					
Site 32	0805	surface	18.1	18.3	8.17
"		1	18.5	21.5	7.88
Site 26	0900	surface	18.9	25.3	8.01
"		1	18.8	25.3	7.57
Site 27	0959	surface	19.3	25.4	8.31
"		1	19.0	25.5	8.90
Site 28	1035	surface	18.8	25.6	7.84
"		1	18.7	25.6	7.69
Site 29	1130	surface	19.0	24.8	8.95
"		1	19.0	24.9	8.41
Site 30	1235	surface	19.4	24.5	7.15
"		1	19.3	24.6	7.36
Site 31	1310	surface	19.7	24.5	7.21
Site 15	1350	surface	19.4	20.9	7.82
"		1	19.1	23.8	8.44
July 17/00					
Site 22	1300	surface	20.2	0.7	7.47
"		1	20.4	17.8	6.84

Table 8 (cont'd).

Date/Site	Time (PST)	Depth (m)	Temp (°C)	Salinity (‰)	Oxygen (mg/L)
July 17/00					
Site 23	1415	surface	28.3	11.3	9.47
Site 39	1440	surface	21.4	1.1	10.17
"		1	21.5	10.4	7.70
Site 6	1510	surface	20.1	23.7	8.91
"		1	19.8	23.8	9.40
Site 8	1605	surface	21.7	20.6	7.45
"		1	20.5	22.0	7.29
Site 20	1640	surface	22.3	1.2	10.50
"		1	22.5	1.5	10.30
Site 14	1715	surface	21.2	0.4	9.20
"		1	21.1	0.5	9.42
Site 24	1740	surface	21.1	0.0	8.38
"		1	21.0	0.0	8.35
Site 1A	1845	surface	21.3	0.0	7.93
"		1	21.3	0.0	7.59
Site 23	1920	surface	23.1	8.8	7.90
"		1	24.1	10.8	7.39
July 20/00					
Site 15	0825	surface	18.9	25.0	9.54
"		1	18.1	25.7	9.98
Site 32	0855	surface	18.9	25.6	10.51
"		1	18.2	25.9	10.10
Site 33	0925	surface	17.8	26.6	10.46
"		1	17.0	26.5	9.69
"		2	16.8	26.5	10.09
Site 25	1000	surface	20.2	25.4	10.87
"		1	19.2	25.3	10.90
"		2	18.9	25.5	10.85
Site 26	1030	surface	20.0	25.3	11.05
"		1	19.5	25.4	12.10
"		2	19.0	25.4	11.38
Site 27	1155	surface	21.4	25.4	10.56
"		1	18.4	25.9	11.03
"		2	17.7	25.9	11.12
Site 29	1230	surface	21.1	25.1	10.00
"		1	19.5	25.3	10.76

Table 8 (cont'd).

Date/Site	Time (PST)	Depth (m)	Temp (°C)	Salinity (‰)	Oxygen (mg/L)
July 20/00					
Site 29	1230	2	19.3	25.6	10.83
Site 30	1300	surface	22.4	25.2	9.46
"		1	20.1	25.3	11.35
July 25/00					
Site 39	0805	surface	n/s	n/s	n/s
Site 6	0835	surface	18.5	24.9	8.67
"		1	14.1	27.9	7.80
Site 8	0920	surface	18.6	26.0	7.09
"		1	16.5	27.0	7.40
Site 11	1010	surface	20.0	0.7	9.38
"		1	19.9	0.7	9.27
Site 14	1045	surface	20.9	1.7	10.70
"		1	21.2	7.3	9.95
Site 24	1145	surface	20.6	0.0	9.68
"		1	20.5	0.0	9.60
Site 17	1240	surface	20.6	0.0	9.29
"		1	20.6	0.0	8.88
"		2	20.6	0.0	9.02
Site 21	1310	surface	20.6	0.2	8.96
"		1	20.5	0.4	8.64
July 27/00					
Site 41	0900	surface	16.4	1.6	3.37
Site 42	0925	surface	17.5	0.0	9.08
"		1	17.6	0.0	6.60
Site 45	0945	surface	16.7	2.6	8.40
Site 44	1010	surface	17.2	7.5	6.26
Site 43	1020	surface	16.6	3.3	9.48
August 1/00					
Site 22	1320	surface	20.5	0.7	10.50
"		1	20.3	1.6	9.50

Table 8 (cont'd).

Date/Site	Time (PST)	Depth (m)	Temp (°C)	Salinity (‰)	Oxygen (mg/L)
August 1/00					
Site 8	1400	surface	18.6	23.7	8.00
"		1	17.9	24.2	8.60
Site 6	1445	surface	19.4	18.1	9.33
"		1	17.6	24.4	9.42
Site 12	1615	surface	21.8	0.4	9.88
"		1	21.6	0.5	10.45
Site 11	1640	surface	n/s	n/s	n/s
Site 4	1715	surface	19.1	22.7	9.00
"		1	18.2	24.3	9.70
Site 40	1750	surface	26.1	21.5	7.71
"		1	25.8	21.9	6.00
Site 21	1820	surface	21.1	0.3	8.40
"		1	21.1	0.2	8.60
August 3/00					
Site 15	0820	surface	17.6	24.2	9.56
"		1	17.5	24.2	9.38
"		2	17.5	24.5	9.37
Site 32	0848	surface	17.1	24.6	9.41
"		1	16.9	24.7	9.16
"		2	16.9	24.8	9.33
Site 33	0915	surface	17.1	24.7	9.24
"		1	17.1	24.7	9.19
Site 25	1000	surface	18.5	24.7	9.83
"		1	18.1	24.7	10.00
Site 26	1040	surface	18.8	24.7	9.80
"		1	18.1	24.7	9.28
Site 27	1140	surface	19.2	24.7	9.60
"		1	18.5	24.7	9.33
Site 29	1220	surface	20.3	24.2	9.51
"		1	19.7	24.2	8.94
Site 31	1255	surface	21.3	23.9	8.23
"		1	19.0	23.9	9.41
"		2	18.7	23.9	9.84
Site 34	1335	surface	21.5	23.9	11.10
"		1	19.8	24.0	12.22

Table 8 (cont'd).

Date/Site	Time (PST)	Depth (m)	Temp (°C)	Salinity (‰)	Oxygen (mg/L)
August 9/00					
Site 12	0910	surface	18.9	0.1	10.00
"		1	18.9	0.2	10.21
Site 39	0945	surface	19.3	0.6	10.30
"		1	19.5	19.7	5.22
Site 6	1020	surface	19.0	23.9	9.55
"		1	18.7	24.5	9.48
Site 8	1050	surface	19.4	22.8	8.70
"		1	18.4	25.5	10.25
"		2	17.6	26.0	9.38
Site 11	1210	surface	19.9	0.3	10.30
"		1	19.8	2.7	10.40
Site 1	1230	surface	20.4	0.0	9.89
"		1	20.3	0.0	9.27
"		2	20.3	0.0	9.44
Site 21	1255	surface	20.4	0.2	8.80
"		1	20.3	0.3	9.40
Site 24	1330	surface	21.2	0.0	10.28
"		1	20.9	0.0	9.90
Site 20	1400	surface	21.4	0.7	10.40
"		1	21.3	6.5	9.98
August 11/00					
Site 54	1100	surface	n/s	n/s	n/s
Site 53	1145	surface	17.8	26.1	9.63
"		1	17.8	26.0	9.78
"		2	17.4	26.2	10.04
Site 47	1230	surface	19.2	22.5	8.75
"		1	19.0	24.5	10.04
"		2	19.2	24.8	10.08
August 15/00					
Site 17	0825	surface	18.2	0.0	9.83
"		1	18.2	0.0	10.10
Site 1	0900	surface	18.2	0.0	10.93
"		1	18.2	0.0	10.85
Site 12	0925	surface	18.4	1.1	10.88

Table 8 (cont'd).

Date/Site	Time (PST)	Depth (m)	Temp (°C)	Salinity (‰)	Oxygen (mg/L)
August 15/00					
Site 12	0925	1	18.4	1.1	10.40
Site 39	1000	surface	19.3	20.0	10.70
Site 22	1030	surface	18.7	1.1	9.90
"		1	18.6	1.6	9.65
August 17/00					
Site 37	0900	surface	17.4	26.2	11.20
"		1	16.5	26.8	10.80
Site 48	0935	surface	17.3	26.5	11.50
"		1	17.1	26.5	11.31
"		2	17.0	26.6	10.84
Site 49	1010	surface	17.5	26.4	9.26
"		1	17.5	26.5	10.64
"		2	17.4	26.5	10.43
Site 51	1035	surface	16.6	26.6	10.43
"		1	16.6	26.7	9.59
"		2	16.6	26.7	10.55
Site 55	1140	surface	16.9	21.9	9.17
"		1	17.4	24.4	9.86
"		2	17.5	26.0	10.91
August 22/00					
Site 54	0830	surface	15.5	26.7	9.78
"		1	15.0	27.1	9.95
"		2	14.9	27.1	10.11
"		3	14.8	27.2	9.94
Site 35	0915	surface	n/s	n/s	n/s
Site 37	1000	surface	16.2	26.7	9.48
"		1	14.0	27.6	9.84
"		2	13.8	27.6	9.30
"		3	13.7	27.7	9.46
Site 36	1030	surface	15.3	27.2	9.59
"		1	14.8	27.3	9.56
"		2	14.3	27.5	9.06
"		3	14.0	27.5	9.20

Table 8 (cont'd).

Date/Site	Time (PST)	Depth (m)	Temp (°C)	Salinity (‰)	Oxygen (mg/L)
August 22/00					
Site 47	1125	surface	16.3	26.9	9.32
"		1	16.0	27.0	9.12
"		2	15.6	27.1	9.47
"		3	15.6	27.1	9.46
August 24/00					
Site 48	0830	surface	17.9	24.6	9.48
"		1	18.0	25.2	11.02
"		2	17.9	26.1	11.75
"		3	16.4	27.1	13.49
Site 49	0900	surface	18.4	25.0	10.36
"		1	17.6	25.8	10.42
"		2	17.6	26.7	12.29
"		3	15.8	27.1	12.16
"		4	15.5	27.1	11.87
Site 50	0940	surface	18.3	24.8	9.76
"		1	17.7	25.3	9.58
"		2	17.8	25.9	9.50
"		3	17.6	26.2	10.34
"		4	16.8	26.9	11.77
Site 51	1010	surface	18.7	24.2	9.13
"		1	18.2	25.3	9.46
"		2	18.0	25.5	9.28
"		3	17.7	25.9	10.15
"		4	17.4	26.0	9.24
Site 55	1040	surface	19.1	23.0	9.57
"		1	18.8	23.3	9.86
"		2	18.7	24.4	10.03
"		3	18.4	24.9	10.04
"		4	18.1	25.3	10.15
August 29/00					
Site 54	0830	surface	15.9	26.1	9.38
"		1	16.0	26.1	9.22
"		2	15.5	26.5	9.93

Table 8 (cont'd).

Date/Site	Time (PST)	Depth (m)	Temp (°C)	Salinity (‰)	Oxygen (mg/L)
August 29/00					
Site 54	0830	3	15.5	26.6	9.72
"		4	15.4	26.7	9.37
Site 53	0900	surface	15.5	26.2	9.25
"		1	15.3	26.8	9.55
"		2	15.3	26.8	9.36
"		3	15.3	26.8	9.39
"		4	15.3	26.8	9.03
Site 47	0945	surface	15.9	26.0	9.60
"		1	15.8	26.5	8.79
"		2	15.6	27.1	8.91
"		3	14.3	27.3	8.70
"		4	13.9	27.6	8.44
Site 55	0940	surface	16.1	22.9	8.63
"		1	16.0	25.1	8.75
"		2	15.9	25.6	8.08
"		3	15.8	26.3	7.50
"		4	15.7	26.5	7.98
"		5	15.7	26.7	9.14
Site 46	1140	surface	16.6	13.4	10.29
"		1	15.9	25.2	8.39
"		2	15.6	26.4	8.67
"		3	15.5	26.7	8.26
"		4	15.4	26.8	8.11
September 6/00					
Site 36	0915	surface	15.5	26.7	12.08
"		1	15.0	26.9	11.70
"		2	14.4	27.3	10.32
"		3	13.8	27.5	9.89
"		4	13.3	27.8	8.60
"		5	13.2	27.9	8.79
Site 54	1030	surface	15.2	27.2	9.34
"		1	14.7	27.4	9.23
"		2	14.3	27.5	9.14
"		3	14.1	27.6	8.96
"		4	14.0	27.6	9.32

Table 8 (cont'd).

Date/Site	Time (PST)	Depth (m)	Temp (°C)	Salinity (‰)	Oxygen (mg/L)
September 6/00					
Site 54	1030	5	14.0	27.6	9.61
Site 49	1130	surface	15.7	26.4	12.37
"		1	15.1	26.7	12.24
"		2	14.9	26.9	12.90
"		3	14.9	27.0	12.77
"		4	14.8	27.1	12.88
"		5	14.8	27.1	13.01
Site 52	1210	surface	15.9	22.6	11.42
"		1	15.5	24.0	11.03
"		2	15.8	25.9	11.36
"		3	14.7	27.3	11.39
"		4	14.0	27.6	11.66
"		5	13.8	27.7	12.49

Table 9. Fish captured during the beach seine survey (refer to Table 7 for abbreviations).

Date /Site	Set No.	Time PST	Tide (m)	PA SA	PE GU	KE LP	SH IN	PI LE	BL AC	RO NO	SA NO	UN SC	UN PE	UN GR	UN GU	UN RO	UN BL	TH ST	SN PR	CH UM	CO HO	MK CO	WL CO	CO FR	RA IN	CH IN	MK CH	WL CK	HA LI	FL AT	CR GU	SA GU	ST FL	CU TT	ST HE	BA PI
11																																				
July																																				
17	1	0835	1.5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	9	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0
"	2	0900	1.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
1	1	0920	1.8	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4	0	0	0
"	2	0930	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
18	1	1005	2.1	0	0	0	0	0	0	0	0	12	0	0	0	0	0	7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	0	0	0
"	2	1015	"	0	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
8	1	1045	2.4	0	0	0	25	0	0	0	1	59	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
"	2	1100	2.9	0	0	0	41	0	0	0	0	36	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1
6	1	1200	3.3	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	1210	3.4	0	0	0	0	0	0	0	2	6	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	1	1237	3.6	0	0	0	0	0	0	0	0	28	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	7	0	0	0
"	2	1245	"	0	0	0	0	0	0	0	0	16	1	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	6	0	0	0
20	1	1310	3.7	0	0	0	0	0	0	0	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
"	2	1325	3.8	0	0	0	0	0	0	0	0	7	3	0	0	0	0	2	0	0	5	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0
11	1	1400	"	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
"	2	1415	"	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
21	1	1440	4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	0	10	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
"	2	1500	"	0	0	0	0	0	0	0	0	2	0	0	0	0	0	7	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOT							66				3	183	11	2	1			87	1		20	1			26					3		21	10		2
13																																				
July																																				
32	1	0805	0.9	0	0	0	0	0	0	0	4	31	18	0	0	1	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
"	2	0815	"	0	0	2	4	0	0	0	4	5	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
26	1	0900	1.3	1	0	10	41	0	0	0	0	72	0	1	118	0	0	2	0	0	0	0	0	0	0	2	0	0	0	18	0	0	0	0	0	57
"	2	0918	"	0	0	8	281	0	0	0	0	70	0	0	103	0	0	7	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	46
27	1	0959	1.4	11	0	0	30	33	0	0	0	35	0	0	47	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	55
"	2	1010	"	1	0	32	44	0	0	0	0	40	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	45
28	1	1035	1.6	0	0	19	0	0	0	0	0	185	0	0	1	0	0	7	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	25

Table 9 (cont'd).

Date /Site	Set No.	Time PST	Tide (m)	PA SA	PE GU	KE LP	SH IN	PI LE	BL AC	RO NQ	SA ND	UN SC	UN PE	UN GR	UN GU	UN RO	UN BL	TH ST	SN PR	CH UM	CO HO	MK CO	WL CO	CO FR	RA IN	CH IN	MK CH	WL CK	HA LI	FL AT	CR GU	SA GU	ST FL	CU TT	ST HE	BA PI
13																																				
July																																				
28	2	1050	1.7	0	0	0	5	0	0	0	0	70	0	0	2	0	0	16	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	29
29	1	1130	2.0	0	0	1	2	0	0	1	0	9	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
"	2	1140	2.2	0	0	5	25	0	0	0	0	6	0	0	13	0	0	1	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	7
30	1	1235	2.8	0	0	0	1	0	0	0	0	18	0	0	14	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0
"	2	1245	"	0	0	0	6	0	0	0	0	13	0	1	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
31	1	1310	3.1	0	0	0	31	0	0	0	0	32	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0
"	2	1320	3.3	0	0	0	45	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	1350	3.4	0	0	0	62	0	0	0	0	5	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
"	2	1400	3.6	0	0	0	107	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
TOT				13		77	684	33		1	8	602	18	3	356	1	3	35								14				50			2			271
17																																				
July																																				
22	1	1300	1.3	0	0	0	129	0	0	0	0	22	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0
"	2	1310	1.4	0	0	0	15	0	0	0	1	24	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0
23	1	1415	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	1	1440	2.3	0	0	0	0	0	0	0	0	15	28	0	0	0	0	0	0	0	1	0	0	0	0	8	0	0	0	0	0	0	1	0	0	0
"	2	1450	2.9	0	0	0	0	0	0	0	0	20	32	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
6	1	1510	3.2	2	0	0	0	0	0	0	135	77	34	0	0	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
"	2	1520	"	0	0	0	0	0	1	0	155	82	3	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
8	1	1605	3.6	0	0	0	0	0	0	0	0	19	53	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
"	2	1615	3.8	0	0	0	0	0	0	0	0	9	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	1	1640	3.9	0	0	0	0	0	0	0	0	29	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	1650	4.1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
14	1	1715	4.1	0	0	0	0	0	0	0	0	12	30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	1720	4.2	0	0	0	0	0	0	0	0	17	25	0	0	0	0	14	0	0	4	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
24	1	1740	4.4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
"	2	1750	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	0	0	0	0	0	0	0	3	0	0
1A	1	1845	4.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0
"	2	1850	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0

Table 9 (cont'd).

Date /Site	Set No.	Time PST	Tide (m)	PA SA	PE GU	KE LP	SH IN	PI LE	BL AC	RO NQ	SA ND	UN SC	UN PE	UN GR	UN GU	UN RO	UN BL	TH ST	SN PR	CH UM	CO HO	MK CO	WL CO	CO FR	RA IN	CH IN	MK CH	WL CK	HA LI	FL AT	CR GU	SA GU	ST FL	CU TT	ST HE	BA PI
17																																				
July																																				
23	1	1920	4.6	0	0	0	0	0	0	0	0	11	12	0	0	0	0	8	0	0	0	0	0	0	0	1	0	0	0	7	0	0	2	0	0	0
"	2	1930	"	0	0	0	0	0	0	0	0	2	34	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TOT				2			144		1		291	333	252		3			55	5		5			13	15	19				8		10	7	4		
20																																				
July																																				
15	1	0825	3.0	0	0	0	6	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	2	0	0	0
"	2	0830	2.8	0	0	0	69	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
32	1	0855	"	0	0	0	0	0	0	0	0	5	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	0900	2.7	0	0	0	0	0	0	0	0	1	137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1	0925	2.1	0	0	0	0	0	0	0	0	62	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0
"	2	0935	2.0	0	0	0	0	0	0	0	0	284	167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	0	0	2	0	0	0
25	1	1000	1.8	0	0	0	0	0	0	0	0	8	131	0	29	0	0	0	0	0	0	0	0	0	0	3	0	0	1	8	0	0	0	0	0	0
"	2	1010	"	0	0	0	0	0	0	0	0	0	111	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
26	1	1030	1.6	0	0	0	0	0	0	0	0	8	23	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
"	2	1040	"	0	0	0	0	0	0	0	0	12	33	0	23	0	0	18	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	17
27	1	1155	1.3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
"	2	1205	"	0	0	0	0	0	0	0	0	19	82	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	22
29	1	1230	"	0	0	0	0	0	0	0	0	48	109	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
"	2	1240	1.4	0	0	0	0	0	0	0	0	120	95	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
30	1	1300	"	0	0	0	0	0	0	0	0	79	34	0	21	0	0	0	1	0	0	0	0	0	0	1	0	0	0	12	0	0	1	0	0	43
"	2	1310	"	0	0	0	0	0	0	0	0	465	9	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	77
TOT							75					1124	1036		201			39	1							4			3	168			7			193
25																																				
July																																				
39	1	0805	2.5	0	0	0	0	0	0	0	0	56	8	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	0815	2.6	0	0	0	0	0	0	0	0	28	0	0	5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0
6	1	0835	2.6	8	0	0	0	0	0	0	78	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	0845	2.5	0	0	0	0	0	0	0	18	25	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
8	1	0920	2.6	0	0	0	0	0	0	0	0	21	2	0	1	0	0	0	8	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Table 9 (cont'd).

Date /Site	Sel No.	Time PST	Tide (m)	PA SA	PE GU	KE LP	SH IN	PI LE	BL AC	RO NO	SA ND	UN SC	UN PE	UN GR	UN GU	UN RO	UN BL	TH ST	SN PR	CH UM	CO HO	MK CO	WL CO	CO FR	RA IN	CH IN	MK CH	WL CK	HA LI	FL AT	CR GU	SA GU	ST FL	CU TT	ST HE	BA PI
25																																				
July																																				
6	2	0925	2.8	0	0	0	0	0	0	0	0	7	5	0	0	0	0	0	20	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
11	1	1010	3.1	0	0	0	0	0	0	0	0	31	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
"	2	1020	3.2	0	0	0	0	0	0	0	0	14	1	0	0	0	0	6	0	0	1	0	0	0	0	1	0	0	0	0	0	0	3	0	0	0
14	1	1045	3.3	0	0	0	0	0	0	0	0	12	30	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0
"	2	1050	"	0	0	0	0	0	0	0	0	12	24	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	1	1145	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
"	2	1155	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	4	0
17	1	1240	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	1245	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	1	1310	3.1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	49	0	0	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	1345	3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	23	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
TOT				8							98	323	73		7			110	28		86				1	6				3			8	2	29	
1																																				
Aug																																				
22	1	1320	1.1	0	0	0	0	0	0	0	0	13	36	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
"	2	1330	"	0	0	0	0	0	0	0	0	12	175	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	4	0	0	0
8	1	1400	1.5	1	0	0	0	0	0	0	0	20	1115	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	1410	1.7	0	0	0	0	0	0	0	0	16	66	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
6	1	1445	2.3	1	0	0	0	0	0	0	0	1	153	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	2
"	2	1455	2.7	24	0	0	0	0	0	0	0	13	75	0	0	0	0	4	0	0	0	0	0	0	0	4	0	0	0	6	0	0	0	0	0	0
12	1	1615	3.9	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	1620	"	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	1	1640	4.1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0
"	2	1650	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	5	0	0	0	0	0	0	0	19	0	0
4	1	1715	"	0	0	0	0	0	0	0	0	0	10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
"	2	1725	4.4	0	0	0	0	0	0	0	0	1	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	1	1750	4.7	0	0	0	0	0	0	0	0	3	10	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
"	2	1800	4.8	0	0	0	0	0	0	0	0	4	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
21	1	1820	5.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	1830	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOT				26								88	1649		73			54	2		1		2			9				22			8	23		2

Table 9 (cont'd).

Date /Site	Set No.	Time PST	Tide (m)	PA SA	PE GU	KE LP	SH IN	PI LE	BL AC	RO NQ	SA ND	UN SC	UN PE	UN GR	UN GU	UN RO	UN BL	TH ST	SN PR	CH UM	CO HO	MK CO	WL CO	CO FR	RA IN	CH IN	MK CH	WL CK	HA LI	FL AT	CR GU	SA GU	ST FL	CU TT	ST HE	BA PI
3																																				
Aug																																				
15	1	0820	4.2	0	0	0	0	0	0	0	0	14	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
"	2	0825	"	0	0	0	0	0	0	0	0	13	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
32	1	0848	4.0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	0855	"	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1	0915	3.8	0	0	0	0	0	0	0	0	9	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	1	0	0	0
"	2	0925	3.7	0	0	0	0	0	0	0	0	42	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0	0	0
25	1	1000	3.3	32	0	0	0	0	0	0	0	44	8	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	13	0	0	0	0	0	0
"	2	1015	3.2	21	0	1	0	0	0	0	0	41	72	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0
26	1	1040	2.9	1	0	0	0	0	0	0	0	10	80	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	8
"	2	1050	2.7	0	0	0	0	0	0	0	0	23	63	0	104	0	0	4	0	0	0	0	0	0	0	1	0	0	0	17	0	0	0	0	0	10
27	1	1140	2.1	0	0	0	0	0	0	0	0	21	37	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
"	2	1150	2.0	0	0	0	0	0	0	0	0	31	7	0	3	0	0	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
29	1	1220	1.7	0	0	0	0	0	0	0	0	5	136	0	23	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	11
"	2	1230	1.6	0	0	0	0	0	0	0	0	10	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
31	1	1255	1.4	5	0	0	0	0	0	0	0	43	0	1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0
"	2	1305	1.3	0	0	0	0	0	0	0	0	40	26	2	90	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5	0	0	0	0	0	2
34	1	1335	1.2	0	1	0	0	0	0	0	0	41	8	1	54	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	90
"	2	1345	"	0	0	0	0	0	0	0	0	39	15	0	62	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
TOT				59	1	1						431	612	4	437			24	1							3				97			2			245
9																																				
Aug																																				
12	1	0910	2.3	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
"	2	0920	2.4	0	0	0	0	0	0	0	0	13	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0
39	1	0945	2.7	0	0	0	0	0	0	0	0	20	66	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	1
"	2	0955	"	0	0	0	0	0	0	0	0	2	35	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0
6	1	1020	3.0	0	0	0	0	0	0	0	51	41	22	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
"	2	1030	2.5	0	0	0	0	0	0	0	97	22	107	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8	1	1050	2.8	0	0	0	0	0	0	0	0	0	14	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	1100	"	0	0	0	0	0	0	0	0	1	31	0	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
11	1	1210	3.5	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 9 (cont'd).

Date /Site	Set No.	Time PST	Tide (m)	PA SA	PE GU	KE LP	SH IN	PI LE	BL AC	RO NQ	SA ND	UN SC	UN PE	UN GR	UN GU	UN RO	UN BL	TH ST	SN PR	CH UM	CO HO	MK CO	WL CO	CO FR	RA IN	CH IN	MK CH	WL CK	HA LI	FL AT	CR GU	SA GU	ST FL	CU TT	ST HE	BA PI
9																																				
Aug																																				
11	2	1215	3.5	0	0	0	0	0	0	0	0	1	6	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	
1	1	1230	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
"	2	1240	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	1	1255	3.9	0	0	0	0	0	0	0	0	2	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
"	2	1300	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
24	1	1330	4.1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
"	2	1340	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
20	1	1400	4.2	0	0	0	0	0	0	0	0	0	15	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
"	2	1410	"	0	0	0	21	0	0	0	0	1	0	0	0	0	0	6	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0
TOT							21				148	114	298		34			119	1		15				4					1			16	2	10	3
15																																				
Aug																																				
17	1	0825	2.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
"	2	0830	2.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	1	0900	2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	
"	2	0905	2.3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	
12	1	0925	2.1	0	0	0	0	0	0	0	0	9	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
"	2	0950	1.9	0	0	0	0	0	0	0	0	11	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	
39	1	1000	1.8	0	0	0	0	0	0	0	0	34	28	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
"	2	1005	"	0	0	0	0	0	0	0	0	20	16	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	4	0	0	
22	1	1030	1.6	0	0	0	0	0	0	0	0	4	49	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
"	2	1035	1.5	0	0	0	0	0	0	0	0	0	111	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	
TOT												81	214	1	31			3			4				2					15			9	2		

Table 10. Fish captured during the purse seine survey (refer to Table 7 for abbreviations).

Date /Site	Set No.	Time PST	Tide (m)	PA SA	PE GU	KE LP	SH IN	PI LE	BL AC	RO NQ	SA ND	UN SC	UN PE	UN GR	UN GU	UN RO	UN BL	TH ST	SN PR	CH UM	CO HO	MK CO	WL CO	CO FR	RA IN	CH IN	MK CH	WL CK	HA LI	FL AT	CR GU	SA GU	ST FL	CU TT	ST HE	BA PI
11																																				
Aug																																				
54	1	1100	2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
53	1	1145	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
47	1	1230	3.0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TOT												2	2					10								3										2
17																																				
Aug																																				
37	1	0900	2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
48	1	0935	1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
49	1	1010	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0
51	1	1035	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	1	1140	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOT																		2									1	8								
22																																				
Aug																																				
54	1	0830	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
35	1	0915	3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1	1000	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1	1030	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	1	1125	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
TOT																				1						3	1									
24																																				
Aug																																				
48	1	0830	2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	1	0900	2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	1	0940	2.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	1	1010	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	1	1040	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
TOT																										1										

Table 10 (cont'd).

Date /Site	Set No.	Time PST	Tide (m)	PA SA	PE GU	KE LP	SH IN	PI LE	BL AC	RO NQ	SA ND	UN SC	UN PE	UN GR	UN GU	UN RO	UN BL	UN ST	TH PR	SN UM	CH HO	CO CO	MK CO	WL CO	CO FR	RA IN	CH IN	MK CH	WL CK	HA LI	FL AT	CR GU	SA GU	ST FL	CU TT	ST HE	BA PI
29																																					
Aug																																					
54	1	0830	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1	0900	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	1	0945	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	1	0940	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	1	1140	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOT																		6																			
6																																					
Sept																																					
36	1	0915	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	1	1030	3.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	1	1130	3.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	1	1210	"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOT																		1																			

Table 11. Fish captured during the pole seine survey (refer to Table 7 for abbreviations).

Date /Site	Set No.	Time PST	Tide (m)	PA SA	PE GU	KE LP	SH IN	PI LE	BL AC	RO NQ	SA ND	UN SC	UN PE	UN GR	UN GU	UN RO	UN BL	UN ST	TH PR	SN UM	CH HO	CO CO	MK CO	WL CO	CO FR	RA IN	CH IN	MK CH	WL CK	HA LI	FL AT	CR GU	SA GU	ST FL	CU TT	ST HE	BA PI
27																																					
July																																					
41	1	0900	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1	0925	1.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	1	0945	1.9	0	0	0	0	0	0	0	0	21	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	2	0950	"	0	0	0	0	0	0	0	0	19	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
44	1	1010	2.1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	1	1020	2.2	0	0	0	0	0	0	0	0	7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
"	2	1030	2.4	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOT												48	3					22																2			

Table 12. Lengths, weights and K-factors for juvenile salmonids (see Table 7 for abbreviations).

Date	Site	Time (PST)	Set No.	Fish Spp.	Length (mm)	Weight (g)	K Factor
11-Jul	17	0835	1	CHIN	86	6.9	1.08
11-Jul	17	0835	1	CHIN	85	6.7	1.09
11-Jul	17	0835	1	CHIN	74	4.5	1.11
11-Jul	17	0835	1	CHIN	77	5.0	1.10
11-Jul	17	0835	1	CHIN	81	5.4	1.02
11-Jul	17	0835	1	CHIN	82	6.0	1.09
11-Jul	17	0835	1	CHIN	80	5.6	1.09
11-Jul	17	0835	1	CHIN	87	6.6	1.00
11-Jul	17	0835	1	CHIN	81	5.4	1.18
11-Jul	17	0835	1	CHIN	69	4.0	1.22
11-Jul	1	0920	1	CHIN	76	4.6	1.05
11-Jul	1	0920	1	CHIN	81	5.7	1.25
11-Jul	1	0920	2	CHIN	80	5.8	1.13
11-Jul	1	0920	2	COHO	70	3.8	1.11
11-Jul	1	0930	2	COHO	64	3.1	1.18
11-Jul	18	1005	1	CHIN	82	6.2	1.12
11-Jul	8	1045	1	CHIN	72	4.8	1.29
11-Jul	19	1237	1	CHIN	81	5.0	1.10
11-Jul	19	1245	2	CHIN	85	6.1	0.99
11-Jul	20	1310	1	CHIN	80	4.4	0.86
11-Jul	20	1325	2	MKCO	105	10.1	0.87
11-Jul	20	1325	2	COHO	81	6.1	1.34
11-Jul	20	1325	2	COHO	60	2.6	1.20
11-Jul	20	1325	2	COHO	64	2.8	1.07
11-Jul	20	1325	2	COHO	87	7.2	1.09
11-Jul	20	1325	2	COHO	93	9.0	1.12
11-Jul	20	1325	2	CHIN	92	8.4	1.08
11-Jul	20	1325	2	CHIN	86	6.2	0.97
11-Jul	20	1325	2	CHIN	74	4.4	1.09
11-Jul	21	1440	1	COHO	57	2.2	1.19
11-Jul	21	1440	1	COHO	62	3.0	1.26
11-Jul	21	1440	1	COHO	64	3.2	1.22
11-Jul	21	1440	1	COHO	56	1.9	1.08
11-Jul	21	1440	1	COHO	61	2.5	1.10
11-Jul	21	1440	1	COHO	54	1.2	0.76
11-Jul	21	1440	1	COHO	63	2.6	1.04
11-Jul	21	1440	1	COHO	69	3.0	0.91

Table 12 (cont'd).

Date	Site	Time (PST)	Set No.	Fish Spp.	Length (mm)	Weight (g)	K Factor
11-Jul	21	1440	1	COHO	59	2.2	1.07
11-Jul	21	1440	1	COHO	62	3.2	1.34
11-Jul	21	1440	1	CHIN	73	3.6	0.93
11-Jul	21	1440	1	CHIN	87	7.2	1.09
13-Jul	32	0805	1	CHIN	90	7.6	1.04
13-Jul	26	0900	1	CHIN	113	14.7	1.02
13-Jul	26	0900	1	CHIN	134	27.2	1.13
13-Jul	29	1140	2	CHIN	110	11.9	0.89
13-Jul	29	1140	2	CHIN	78	4.8	1.01
13-Jul	29	1140	2	CHIN	75	4.2	1.00
13-Jul	29	1140	2	CHIN	85	7.6	1.24
13-Jul	29	1140	2	CHIN	90	8.2	1.12
13-Jul	29	1140	2	CHIN	75	4.5	1.07
13-Jul	29	1140	2	CHIN	78	5.8	1.22
13-Jul	30	1235	1	CHIN	74	3.6	0.89
13-Jul	30	1235	1	CHIN	92	8.7	1.12
13-Jul	31	1310	1	CHIN	85	6.7	1.09
13-Jul	15	1350	1	CHIN	90	6.9	0.95
17-Jul	39	1440	1	CHIN	79	5.2	1.05
17-Jul	39	1440	1	CHIN	76	4.6	1.05
17-Jul	39	1440	1	CHIN	79	5.3	1.07
17-Jul	39	1440	1	CHIN	80	6.0	1.17
17-Jul	39	1440	1	CHIN	75	4.7	1.11
17-Jul	39	1440	1	CHIN	89	7.4	1.05
17-Jul	39	1440	1	CHIN	71	3.9	1.09
17-Jul	39	1440	1	COHO	70	3.7	1.08
17-Jul	39	1440	1	CHIN	74	4.1	1.01
17-Jul	39	1450	2	CHIN	80	5.7	1.11
17-Jul	20	1650	2	CHIN	81	5.7	1.25
17-Jul	14	1720	2	COHO	70	3.8	1.12
17-Jul	14	1720	2	COHO	65	3.1	1.13
17-Jul	14	1720	2	COHO	65	2.8	1.02
17-Jul	14	1720	2	COHO	60	2.5	1.16
17-Jul	14	1720	2	CHIN	81	5.7	1.25
17-Jul	14	1720	2	CHIN	94	7.9	0.95
17-Jul	24	1740	1	CHIN	80	5.9	1.15
17-Jul	24	1740	1	CHIN	82	5.7	1.03
17-Jul	24	1740	1	CHIN	88	7.0	1.03

Table 12 (cont'd).

Date	Site	Time (PST)	Set No.	Fish Spp.	Length (mm)	Weight (g)	K Factor
17-Jul	24	1740	1	CHIN	79	5.1	1.03
17-Jul	24	1740	1	CHIN	90	8.0	1.10
17-Jul	1A	1845	1	COFR	61	2.6	1.15
17-Jul	1A	1845	1	COFR	61	2.9	1.28
17-Jul	1A	1845	1	COFR	60	2.7	1.25
17-Jul	1A	1845	1	COFR	63	2.6	1.04
17-Jul	1A	1845	1	COFR	62	2.4	1.01
17-Jul	1A	1850	2	COFR	55	2.1	1.26
17-Jul	1A	1850	2	COFR	65	3.3	1.20
17-Jul	1A	1850	2	COFR	61	2.6	1.15
17-Jul	1A	1850	2	COFR	58	2.0	1.03
17-Jul	1A	1850	2	COFR	57	2.3	1.24
17-Jul	23	1920	1	CHIN	88	7.3	1.07
20-Jul	25	1000	1	CHIN	125	22.3	1.14
20-Jul	25	1000	1	CHIN	141	36.1	1.29
20-Jul	25	1000	1	CHIN	127	24.1	1.18
20-Jul	30	1300	1	CHIN	80	3.8	0.74
25-Jul	39	0815	2	CHIN	94	8.9	1.07
25-Jul	6	0845	2	CHIN	83	5.9	1.03
25-Jul	6	0845	2	CHIN	97	9.3	1.02
25-Jul	8	0925	2	CHIN	88	7.3	1.07
25-Jul	11	1020	2	CHIN	85	6.3	1.03
25-Jul	11	1020	2	COHO	75	4.5	1.07
25-Jul	21	1310	1	COHO	63	3.0	1.20
25-Jul	21	1310	1	COHO	62	2.4	1.01
25-Jul	21	1310	1	COHO	66	3.3	1.15
25-Jul	21	1310	1	COHO	64	2.5	0.95
25-Jul	21	1310	1	COHO	66	3.5	1.22
25-Jul	21	1345	2	COHO	76	4.9	1.12
25-Jul	21	1345	2	COHO	61	2.7	1.19
25-Jul	21	1345	2	COHO	65	3.4	1.24
25-Jul	21	1345	2	COHO	63	2.6	1.04
25-Jul	21	1345	2	COHO	57	2.2	1.19
25-Jul	21	1345	2	CHIN	82	5.8	1.05
1-Aug	6	1455	2	CHIN	128	22.9	1.10
1-Aug	6	1455	2	CHIN	128	27.5	1.31
1-Aug	6	1455	2	CHIN	101	11.5	1.12
1-Aug	6	1455	2	CHIN	92	10.1	1.30

Table 12 (cont'd).

Date	Site	Time (PST)	Set No.	Fish Spp.	Length (mm)	Weight (g)	K Factor
1-Aug	11	1650	2	WLCO	73	4.8	1.23
1-Aug	11	1650	2	WLCO	75	4.6	1.09
1-Aug	11	1650	2	CHIN	94	8.6	1.04
1-Aug	11	1650	2	CHIN	80	8.7	1.70
1-Aug	11	1650	2	CHIN	85	7.1	1.16
1-Aug	11	1650	2	CHIN	86	6.8	1.07
1-Aug	11	1650	2	CHIN	86	6.8	1.07
1-Aug	21	1820	1	COHO	70	3.6	1.05
3-Aug	25	1000	1	CHIN	160	47.4	1.16
3-Aug	26	1050	2	CHIN	123	17.4	0.94
3-Aug	31	1305	2	CHIN	103	11.1	1.02
9-Aug	20	1410	2	COHO	84	6.6	1.11
9-Aug	20	1410	2	COHO	79	6.6	1.34
9-Aug	20	1410	2	COHO	79	5.8	1.18
9-Aug	20	1410	2	COHO	70	3.7	1.08
9-Aug	20	1410	2	COHO	72	4.1	1.10
9-Aug	20	1410	2	COHO	79	5.8	1.18
9-Aug	20	1410	2	COHO	78	5.5	1.16
9-Aug	20	1410	2	COHO	88	7.9	1.16
9-Aug	20	1410	2	COHO	73	4.5	1.16
9-Aug	20	1410	2	COHO	75	4.6	1.09
9-Aug	20	1410	2	COHO	88	7.2	1.06
11-Aug	53	1145	1	CHIN	175	65.0	1.21
11-Aug	53	1145	1	CHIN	115	17.5	1.15
15-Aug	17	0825	1	COHO	57	1.8	0.97
15-Aug	17	0825	1	COHO	70	3.9	1.14
15-Aug	17	0830	2	COHO	57	2.2	1.19
15-Aug	1	0900	1	COHO	57	1.8	0.97
17-Aug	37	0900	1	WLCK	145	29.8	0.98
17-Aug	37	0900	1	WLCK	150	44.0	1.30
17-Aug	37	0900	1	WLCK	140	30.7	1.12
17-Aug	37	0900	1	WLCK	135	28.9	1.18
17-Aug	48	0935	1	WLCK	138	28.9	1.10
17-Aug	48	0935	1	WLCK	154	42.2	1.16
17-Aug	48	0935	1	WLCK	124	21.8	1.14
17-Aug	49	1010	1	MKCH	135	27.7	1.13
17-Aug	49	1010	1	WLCK	140	30.9	1.13
22-Aug	54	0830	1	CHIN	218	131.0	1.26

Table 12 (cont'd).

Date	Site	Time (PST)	Set No.	Fish Spp.	Length (mm)	Weight (g)	K Factor
22-Aug	54	0830	1	MKCH	250	170.0	1.09
22-Aug	47	1125	1	CHIN	138	26.8	1.02
22-Aug	47	1125	1	CHIN	154	40.8	1.12
22-Aug	47	1125	1	CHUM	150	31.9	0.95
24-Aug	55	1040	1	CHIN	130	20.7	0.94

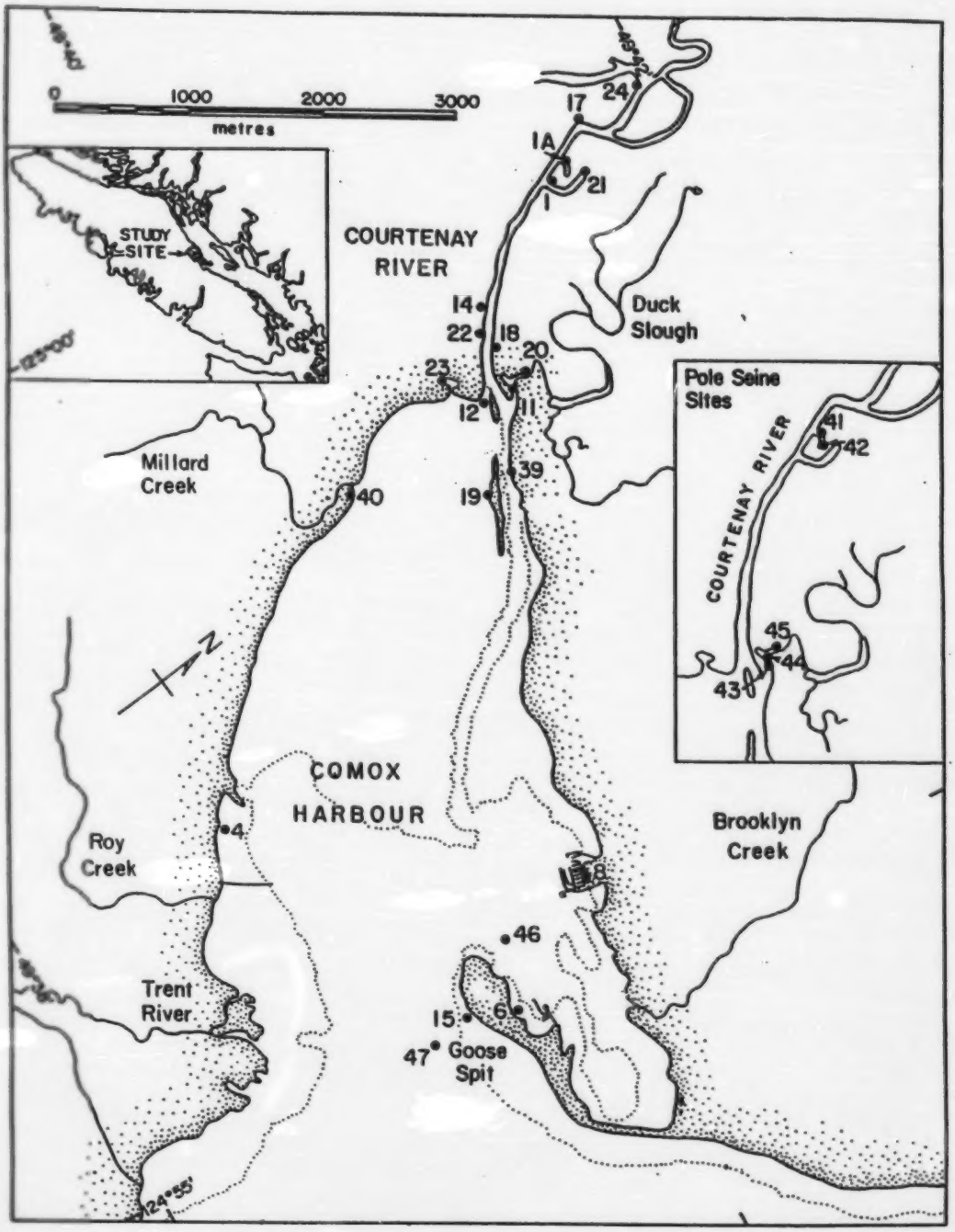

Figure 1. Map of the Courtenay River estuary showing the twenty-six sites sampled in the 2000 survey.

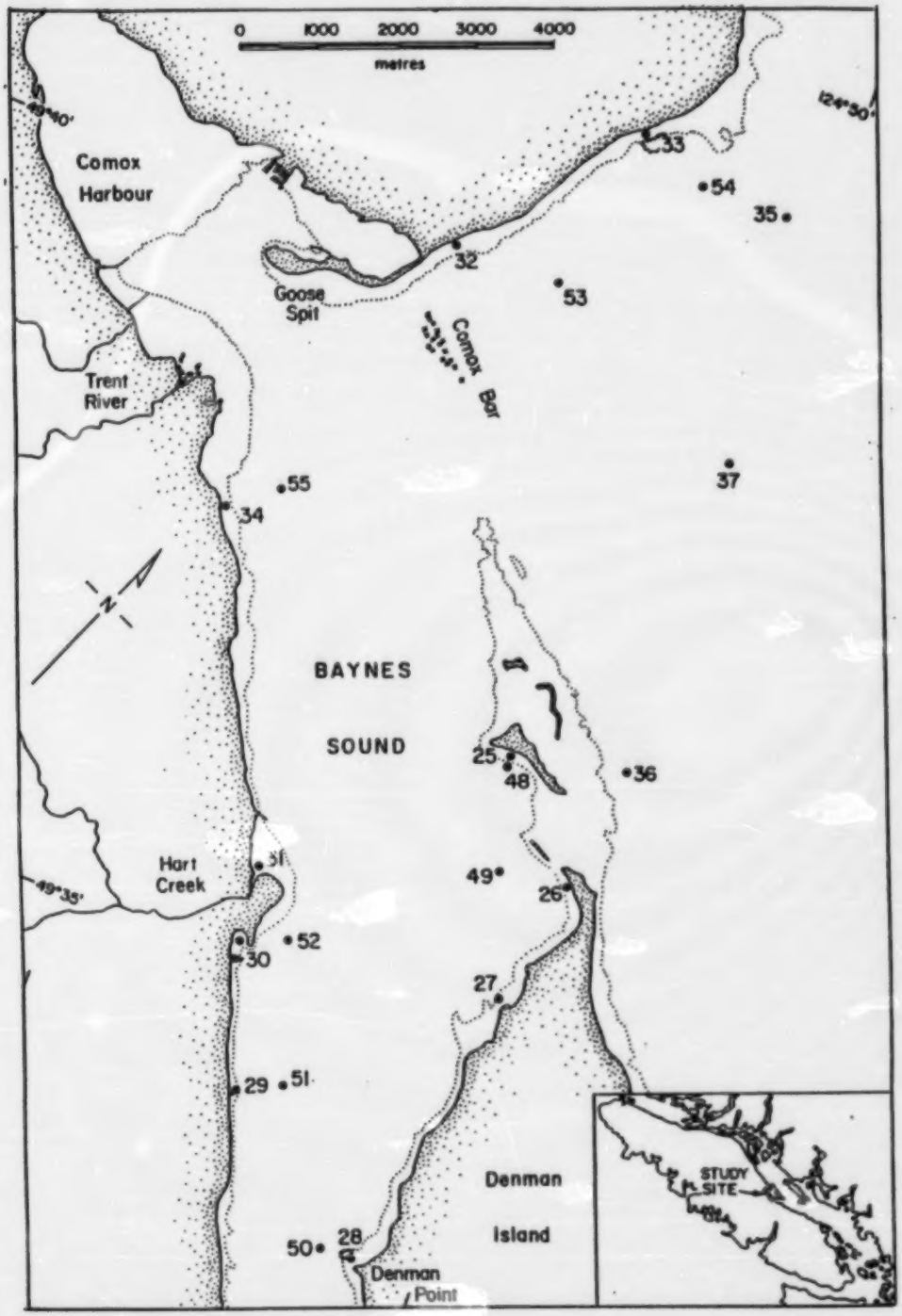

Figure 2. Map of Baynes Sound showing the twenty-one sites sampled in the 2000 survey.